

## CLAIMS

What is claimed is:

- 1 1. A package comprising:
  - 2 a die including an active surface;
  - 3 a substrate electrically coupled with the active surface; and
  - 4 an interposer between the die and the substrate, wherein the interposer has a
  - 5 body with a first surface, an opposite second surface, and a channel passing through
  - 6 the body from the first surface to the second surface.
  
- 1 2. The package of claim 1 wherein the channel lies in the die shadow  
2 region.
  
- 1 3. The package of claim 2 wherein the channel is a vent hole to  
2 facilitate capillary flow of underfill mixture dispensed between the interposer and  
3 the substrate.
  
- 1 4. The package of claim 3 wherein underfill mixture is dispensed  
2 between the interposer and the substrate, wherein a meniscus of the underfill  
3 mixture is formed within the vent hole, and the meniscus substantially prevents the  
4 underfill from exiting the first surface of the interposer.
  
- 1 5. The package of claim 1 wherein the channel lies outside of a die  
2 shadow region.
  
- 1 6. The package of claim 5 wherein the channel is a microchannel  
2 through which underfill is dispensed.
  
- 1 7. The package of claim 1 wherein there are at least two channels  
2 formed in the interposer.

1           8.       The package of claim 7 wherein the at least two channels in the  
2 interposer includes a vent hole within a die shadow region and a microchannel that  
3 lies outside of the die shadow region, wherein underfill is dispensed into the  
4 microchannel and between the interposer and substrate.

1           9.       A packaging system comprising:  
2            a die;  
3            a substrate electrically coupled with the die;  
4            an interposer between the die and the substrate, wherein the interposer has a  
5 body with a first surface, an opposite second surface, and a channel passing through  
6 the body from the first surface to the second surface; and  
7            underfill mixture dispensed between the interposer and the substrate using  
8 capillary flow.

1           10.      The packaging system of claim 9 wherein the channel is substantially  
2 centered in the interposer.

1           11.      The packaging system of claim 9 wherein the channel is a vent hole  
2 within a die shadow region.

1           12.      The packaging system of claim 9 wherein the channel lies outside of  
2 a die shadow region.

1           13.      The packaging system of claim 12 wherein the die shadow region  
2 extends from an active surface of the die through the interposer to the second  
3 surface.

1           14.      The packaging system of claim 9 wherein there are at least two  
2 channels formed in the interposer, including a channel within a die shadow region,  
3 and a channel that lies outside of the die shadow region.

1        15.    A process comprising:  
2            forming a channel through a channel body from a first surface of an  
3    interposer through to an opposite second surface of the interposer;  
4            disposing the interposer between a die and a substrate; and  
5            dispensing underfill between the interposer and the substrate, wherein the  
6    channel is at least one of a vent hole to facilitate capillary flow of the underfill  
7    mixture, and a microchannel through which the underfill mixture is dispensed.

1        16.    The process of claim 15 wherein air escapes from between the  
2    interposer and the substrate through the vent hole as the underfill mixture is  
3    dispensed.

1        17.    The process of claim 15 wherein the vent hole is substantially  
2    centered in the interposer.

1        18.    The process of claim 15 wherein the microchannel lies outside of a  
2    die shadow region.

1        19.    The process of claim 18 further comprising positioning an underfill  
2    dispenser nozzle to the first surface of the interposer at the channel.

1        20.    The process of claim 19 further comprising positioning an underfill  
2    dispenser nozzle adjacent an outer edge of the die to dispense the underfill mixture  
3    in the channel.

1        21.    The process of claim 15 further comprising positioning the vent hole  
2    within a die shadow region, and positioning an underfill dispenser nozzle adjacent  
3    an outer edge of the die to dispense the underfill mixture through the microchannel  
4    and between the interposer and the substrate.

1           22. The process of claim 15 further comprising dispensing the underfill  
2 mixture from a plurality of underfill mixture dispensers substantially simultaneously  
3 while allowing air to escape from between the substrate and the interposer via the  
4 vent hole.

1           23. The process of claim 22 further comprising forming a plurality of  
2 microchannels in the interposer about the die, wherein the plurality of dispensers are  
3 positioned at the plurality of microchannels, respectively, to dispense the underfill  
4 mixture.